

CHAPTER 2

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Startup Tutorial

Working with the “Smart” Cards

Welcome to the startup tutorial. The best way to learn the RefleX software is to try it. Before proceeding we suggest that you read chapter 1: “Introduction to Coordinate Metrology”. Although it may seem like there are many steps to starting the system, most experienced users can do this quite quickly.

1. Turn the system off via the switch located at the front left corner of the controller.

Controller: card installation location

2. If currently inserted, remove the two “smart cards” from the controller by pressing the eject buttons located at the front of the controller.
3. The card on the left in the picture below is the upper “software” card where the system’s software resides. The card on the right is the lower “storage” card, where your programs are stored.

Storage Card

Software Card

4. Flip the software card over and note the version number on the back. Reinsert the storage card in the bottom, and the software card in the top.
5. Turn the RefleX controller on. If this is a DCC system, turn the machine’s controller (FB-PC) on first, then the RefleX controller.

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Loading the Software

Optional Air Saver

6. For the first 10 seconds, the system's screen may flicker as the controller performs a self-diagnosis. This is completely normal. After successful completion of this self-diagnosis, the system will begin to load the RefleX software. This software loading process will take an additional 1 minute.

"Insert Card" icon

7. If the self-diagnostic test fails, the "Frown face" (or the "skull & crossbones" in older controllers) icon appears. Normally this means that a hardware error has occurred inside the controller. However, there are other causes. See Chapter 11 "Troubleshooting" for more information.

TIP: With multiple storage cards, you may "hot swap" the lower cards. That is, remove and insert cards while the power is on. These additional storage cards may be purchased through Brown & Sharpe only!

"Frown Face" icon

8. If the system cannot load the software, the "Insert Card" icon will appear. This is often caused by accidentally swapping the software and storage cards. Fortunately, this will not damage the controller.
9. Ten seconds into the software loading process, the copyright screen appears. Notice the software version number located in the upper left corner. Notice also, the web address in the center of the screen. This support site contains information such as release notes, frequently asked questions, and supplemental documentation. In addition, you can always send e-mail to reflexsupport@us.bnsmc.com. If your system is equipped with an Air Saver, the air will be turned on at this time.

Copyright Screen

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The Language Screen

10. The Language Screen appears next and a tune is played. The languages currently supported are: English, German, Italian, French, Spanish, Portuguese, Swedish, Finnish, Polish, Dutch, Danish, Czech, Simplified Chinese, Traditional Chinese, Japanese & Korean. For a unilingual environment, you can disable this screen in page 1 of the system options. If disabled, the system proceeds to the home screen.

Select down - Moves the highlighted selection down.

Select right - Moves the highlighted Selection right.

Done - Accepts the current selection and proceeds to the next screen.

Language Screen

11. Try moving the Zmouse, located on the Z rail, up and down. Notice how moving the Zmouse highlights different buttons, or softkeys, on the screen.

Abort

Select
(Up Down)

Press Selected
Softkey
(often 'Done')

Zmouse

TIP: You can operate virtually the entire system from the Z-Mouse. Note: On a desk mouse, these buttons are reversed.

12. Select the desired language and press the Done softkey.

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The Volcomp Screen

Important: Once the (upper) software card has been installed, there is no reason to remove it, except in the case of a software update.

13. When using machines other than DCC or Arms, it is possible that a volcomp problem screen may appear. If this screen is displayed, consult the Troubleshooting, Chapter 11 before proceeding!

Volcomps Mismatch Screen

Important: Never swap software cards between systems. Because the volcomp file is stored on the software card, as well as the controller, moving the software card to a new controller can cause problems which will require a service call!

Tip: It is not necessary to power down the system between measurement jobs. The system uses less electricity than most household light bulbs!

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The Home Screen

Serial Number - For non-DCC and non-arm systems, this number must match the serial number of the machine. If it does not, contact your local service representative, as accuracy will be affected.

System Options - This area, described in Chapter 10, allows you to set options such as volume, contrast, machine type, etc.

Service Utilities - For service personnel only in the event of a problem.

Machine - The correct machine must be chosen in the system options. If it is not, part drawing scaling will not work correctly.

Done - Tells system the machine is homed and to move to the next screen.

14. The next screen to appear will be the home screen which prompts you to perform the homing process. As shown on the screen, move the machine to the upper left front position. Locking the XYZ airlocks is recommended at this point. Because the Z-Mouse will be hidden inside of the Z-rail, the Done button must be pressed on the controller's keypad.

14. The next screen to appear will be the home screen which

prompts you to perform the homing process. Stand in back of the machine and move it to the upper, left, back position. Locking the XYZ airlocks is recommended at this point. Press the done softkey to continue.

14. The next screen to appear will be the home screen which prompts you to perform the homing process. Rotate all of the arm's joints until all red LEDs turn off. Press Done to continue.

14. The next screen to appear will be the home screen which prompts you to perform the homing process. Press and hold the "Mach. Start" button on the jog box until the green light turns on. Press the "Go" Softkey when ready. The "Homing In Progress" screen will be displayed as the machine moves around the volume searching for the home position.

XYZ Air Locks

Go

Important: Failure to properly home the machine will result in reduced accuracy as well as improper part drawing scaling.

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Probe Qualification: Select a Probe

Next, unless a "startup probe" has been saved previously, the system will prompt you to qualify a probe. Now we will simply qualify a Touch Trigger Probe, or TTP, but you can refer to Chapter 5, "The Measurement Mode" for more information. The "Select Probe Type" screen, shown below, is the first screen in the probe qualification sequence.

Abort - Returns you to home screen.

Scroll up - Moves highlighted selection up.

Scroll down - Moves highlighted selection down.

Cycle option - Allows you to change option.

Done - The current probe settings are accepted and the qualification process will continue.

Select Probe Screen

15. Leave all settings at their default values (as shown) and select the Done softkey.

16. If you have not already done so, clamp (bolt) the qualification sphere to the table as shown below. Pick a spot where the qualification

sphere will not interfere with measuring parts.

Qualification Sphere Location

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Probe Qualification: Locating the Sphere

17. If currently inserted, remove the probe from the end of the Z-rail. Place the cup in the bottom of the Z-rail on the qualification sphere as shown. At this point, it is recommended, that you lock the axes with the air locks. Press the Done softkey to continue.

Remove Probe Screen

Important: Make sure the TTP probe displayed in these screens matches the one you are actually using. If it doesn't, be sure to switch probe types in the system options, page 4.

Important: To make the probe qualification process more efficient, the "Remove Probe" screen is not shown in subsequent qualifications. Since the system knows where the qualification sphere is located, there is no need to tell it the sphere's location again. Because of this, if the sphere is moved, you must reboot the system and locate the sphere again. Failure to follow this procedure will result in faulty probe offset values.

Two TTPs: The TP-ES (left) and the TP-MIP (right)

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Probe Qualification: Inserting a Probe

18. Reinsert the probe as shown in the screen. The probe locking mechanism must be secure. Use a stylus key to tighten the stylus securely. Press the Done softkey to continue.

Insert Probe Screen

Important: Do not use paper clips in place of stylus keys. Stylus keys are designed to bend before high torque forces break probes. Replacing a stylus key is always preferable to replacing a TTP.

Probe Locking Mechanism

Using a Stylus Key

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Probe Qualification: Measuring the Sphere

Important: When taking a point, do not overtravel the probe. Probe damage can occur after just a couple of millimeters of travel!

Measure Sphere Screen

19. Begin taking points as shown above. Notice the approach vectors. They are perpendicular to the surface of the sphere. The lengths of the approach vectors have been exaggerated for demonstration purposes. Whenever measuring any feature, always allow at least 1 probe radius of approach vector. After taking the first point, the “Measuring Qualification Sphere” screen is displayed. After taking 12 points (27 on arm machines), press the Done softkey to continue. The Done button will remain dimmed, or disabled, until at least 4 points are taken.

Abort

Note: Because the system knows that we are about to measure a sphere here, only 4 points are required. Later, during normal measurement operation, the feature recognition engines require at least 10 points for spheres.

Clear Last Hit
Done

Tip: Use the “Clear Last Hit” softkey to clear the previous hit as opposed to using the Abort key to clear all hits.

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Probe Qualification: The Probe Summary Screen

20. At this point, the “Probe Summary” Screen will be displayed. Check the diameter and form error. Try to get below 10 microns form error for your tip and within 5 microns on the diameter. If your values are too high, press the “Remeasure Sphere” softkey and try again. Otherwise, press the Done softkey. If this is a DCC machine, the system will now go back and remeasure the qual sphere in DCC mode.

Tip: If you are planning on using the same probe for multiple sessions, you may want to save a “startup probe”. To do this, go to the second page of the System Options and set the “Startup Probe” from “Qualify” to “Saved”.

Remeasure Sphere

Qualify Additional Tip
Done

Probe Summary Screen

Troubleshooting: If your probe's diameter is consistently high or low, it could be because the qualification sphere's diameter is set incorrectly. Check the diameter stamped on the side of the sphere. Then check that the "Qual Sphere Dia", found in page 2 of the System Options, is set correctly.

Troubleshooting: If you are consistently getting "Can Not Solve" errors at this screen, it is probably because the system is not seeing movement in an axis. See chapter 11 "Troubleshooting" for more information.

Tip: When qualifying a disk probe, follow the same procedure as describe previously, being careful not to shank the probe. Be sure to move slightly in Z also. Otherwise the system will compute a circle instead of a sphere, resulting in a "Can not solve" error screen.

Good
Bad

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The System Modes Screen

21. At this point, the "System Modes" Screen is displayed. The first 5 softkeys represent different measuring modes. If you do not see all the modes shown here, it is because they have been disabled in the System Options, page 5.

Note: The Dial Indicator and XYZ Counters/Scribe mode will remain dimmed unless a hard (ball) probe is qualified.

System Modes Screen

Tip: Turn off the modes you don't use. This will help alleviate confusion when starting the system.

Tip: The "System Startup" button, located below the "Help" button will bring you back to the "System Modes" screen. If the system is in a state unknown to you, it will help you get where you want to be. This feature helps you to simply "Step up and measure". Note: If the system has not been homed, this button will bring you to the "Home" screen.

The System Startup Button
The Help Button

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System Modes Screen

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